

Duration: 3 Hours

Maximum Marks: 100

Instructions to the candidates:-

- 1) All the questions are compulsory. Choice is internal.
- 2) Figures to the right indicate full marks.
- 3) All questions carry equal marks.
- 4) Draw flowcharts /diagrams wherever necessary.
- 5) Use of simple calculator is permitted.

- Q1 A) Fill in the blanks:** 4
- i) Activation of fatty acids require breakdown of ATP to _____.
 - ii) Acyl-CoA is transferred to the hydroxyl group of carnitine by _____.
 - iii) Acetone, acetoacetate and _____ are considered as ketone bodies.
 - iv) Oxidation of a fatty acid containing 18 carbon atoms to acetyl CoA would require _____ number of cycles.
- Q1 B) Write a note on (ANY ONE)** 4
- i) Beta oxidation of odd carbon chain fatty acids
 - ii) FAS complex
- Q1 C) Answer ANY TWO** 12
- i) Compare the activation steps of beta-oxidation and lipogenesis. Elaborate the same with detailed chemical reactions.
 - ii) Justify- The liver cannot utilise ketone bodies. Add a note on the significance of ketone bodies in starvation and alcoholism
 - iii) Calculate the total number of ATPs generated from the stearic acid.
- Q2 A) Fill in the blanks** 4
- i) The coenzyme used in transamination reaction is _____
 - ii) Decarboxylation of histidine produces _____.
 - iii) _____ is an intracellular receptor.
 - iv) Epinephrine receptor on the cell membrane contains _____ subunits.
- Q2 B) Write a note on ANY ONE** 4
- i) Hormone receptors
 - ii) Ketogenic and glucogenic amino acids
- Q2 C) Answer ANY TWO** 12
- i) Compare oxidative and non-oxidative deamination
 - ii) Discuss in detail the contributions of Kurt Henseliet and Hans Krebs to the field of protein metabolism.
 - iii) With reference to signal transduction comment on
(a) G protein (b) Adenylate cyclase (c) Calcium

- Q3 A) Fill in the blanks** **4**
- Wavelength selectors are of two types, filter and _____.
 - Centrifugal field with respect to gravity is known as _____.
 - Unit of sedimentation coefficient is _____.
 - Amino acids are estimated in colourimeter by reacting with _____ as colour developing agent.
- Q3 B) Compare ANY ONE** **4**
- Preparative and Analytical ultracentrifuge
 - Detectors in colorimeter and spectrophotometer
- Q3 C) Attempt any TWO** **12**
- Derive an expression for Beer Lambert's law. Calculate the molar extinction coefficient of a solution containing 3M of a given substance which absorbs 80% incident light of wavelength 340 nm when the path length is 1 cm.
 - Sujata is asked to prepare a write-up for gradient material used in density gradient centrifugation. Help her collate the data with the aid of following points:
 - Ideal properties of gradient materials
 - Two examples of gradient material.
 - Elaborate on the colorimeter with reference to
 - Source of light
 - Wavelength selector
 - Sample holder
- Q4 A) Fill in the blanks** **4**
- Increase in temperature _____ the rate of migration of analytes.
 - The gas produced at the anode during an electrophoretic run is _____
 - _____ radiation is used for food preservation
 - In GM counter the outer chamber wall serves as _____ electrode.
- Q4 B) Write a short note on ANY ONE** **4**
- Agarose electrophoresis for the separation of DNA.
 - Isoelectric focusing
- Q4 C) Attempt any TWO** **12**
- Defend- Selecting the appropriate support medium, buffer and electric field strength is crucial for electrophoresis.
 - Deriving an expression, explain how the radioactive decay constant is associated with half-life.
 - Compare:
 - Moving boundary and zone electrophoresis
 - Beta and Gamma radiations
- Q5 A) Define** **8**
- Lipogenesis
- OR**
- Beta oxidation
 - cAMP
- OR**
- Ornithine

- e) Swinging bucket rotor
OR
- f) DNSA
- g) Radioactivity
OR
- h) Southern blotting

Q5 B) State True or False with justification

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- i) Oxidation of fatty acids takes place in mitochondrial matrix.
- ii) The atomic mass number is denoted by 'Z'.
- iii) RCF and rpm are not related to each other.
- iv) Lambda max is independent of concentration for a particular biomolecule.
- v) Svedberg (S) is the unit of absorbance.
- vi) pH of the separating gel is 2 units lower than that of stacking gel.
